REMARKS

Claims 1-9 and 11-13 are all the claims pending in the application.

Claims 1, 4-6 and 9 are rejected under 35 U.S.C. §102(b) as being anticipated by Kafka et al. (US 5,365,366). Claims 1, 4-8 and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by Caprara et al. (US 6,097,742). Claims 1, 4-8 and 11 are rejected under 35 U.S.C. §102(e) as being anticipated by Raymond et al. (US 6,393,038). Claims 2, 3, 12, and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over Caprara et al. or Raymond et al. in view of Kurtz et al. (US 5,995,529) and/or Jayaraman (US 5,513,204). Applicant respectfully traverses the claim rejections with the following comments.

Kafka et al. relates to a synchronously pumped optical parametric oscillator for generating high power, broadly tunable pulses with sub-picosecond duration. A preferred embodiment of Kafka et al.'s inventions is shown in figure 1.

Caprara et al. relates to external-cavity optically-pumped semiconductor lasers including an OPS-structure having a mirror-structure surmounted by a surface-emitting, semiconductor multi layer gain structure. Preferred embodiments of the Caprara et al. lasers are shown in figures 1, 5, and 6.

Raymond et al. relates to an apparatus for generating light at a second harmonic frequency, which includes a semiconductor substrate having a first reflector formed on a substrate and a semiconductor active region formed on the substrate, and a non-linear crystal located proximate to the active region and spaced from the active region by an air gap.

Regarding the rejection of claims 1, 4-6 and 9 over Kafka et al., Applicant submits that the reference fails to teach or suggest all of the limitations of the claims. As a preliminary matter, Applicant notes that the Examiner has applied element number 20 of the reference as teaching two separate limitations. According to the Examiner, the LBO crystal 20 corresponds to the surface emitting semiconductor element and also the active layer of the semiconductor element of claim 1 of the present invention. Applicant submits that applying the same element in the reference as allegedly teaching two separate elements of the claims is improper.

Applicant submits that Kafka et al. fail to teach or suggest the first mirror recited in claim 1. The Examiner cites the LBO crystal 20 of Kafka et al. as corresponding to the surface emitting semiconductor element. However, the Examiner cites the curved mirror 14 as allegedly corresponding to the first mirror of claim 1. As shown in figure 1 of the reference, the curved mirror 14 is an entirely separate element from the LBO crystal 20 of the reference. By contrast, claim 1 recites that the surface emitting semiconductor element has a first mirror arranged on one side of the active layer. As clearly shown in figure 1 of the reference, the LBO crystal 20 does not have the curved mirror 14. Rather, the curved mirror 14 is an entirely separate element of the apparatus disclosed in the reference. Hence, Kafka et al. fails to teach or suggest the first mirror of claim 1 of the present invention.

Furthermore, Kafka et al. fail to teach or suggest the second mirror arranged outside the surface emitting semiconductor element so that the first and second mirrors form a resonator in which the second laser light resonates. Nothing in the reference appears to teach or suggest that the mirrors 14 and 16, shown in figure 1, form a resonator in which a second laser light resonates. Instead, the light, which is shown as traveling along optical path 24, passes from the

curved mirror 14 through the LBO crystal 20, is reflected off curved mirror 16, and is then transmitted downward through pin hole 108. Therefore, independent claim 1 is allowable over the reference for this additional reason.

Also, Kafka et al. fail to teach or suggest the modulation unit claimed in claim 1. The Examiner refers to temperature controller circuit 50 as allegedly corresponding to the modulation unit recited in claim 1. However, Applicant submits that rather than being a modulation unit which modulates the surface emitting semiconductor element, the temperature controller circuit 50 simply controls the temperature of the LBO crystal. By contrast, the temperature controller circuit 50 does not modulate the LBO crystal. Therefore, claim 1 is allowable over Kafka et al. for this reason as well.

Additionally, claims 4-6 and 9 are allowable over Kafka et al., at least because of their dependence from claim 1.

With further regard to claims 4 and 5, Kafka et al. does not teach or suggest the limitations of these claims. As recited in claim 4, the surface emitting semiconductor element comprises a structure for controlling a spatial mode of the second light. The Examiner asserts that pin hole 108 corresponds to this limitation of claim 4, but Applicant disagrees. As shown in figure 1, the pin hole 108 is not comprised by the LBO crystal 20. Rather, the pin hole 108 is a completely separate element of the apparatus. Hence, claim 4, and claim 5 which depends from claim 4, are not anticipated by the reference for this additional reason.

For the rejections of claims 1, 4-8 and 11 over Caprara et al., Applicant submits that the reference fails to teach or suggest all of the limitations of the claims. In particular, Caprara et al. do not teach or suggest the modulation unit claimed in claim 1. The Examiner refers to

controller 82 as allegedly corresponding to the modulation unit of claim 1. However, as disclosed in the reference at column 15, lines 3-5, the controller 82 adjusts driver 76 to maintain peak output power. By contrast, claim 1 of the present invention recites that the modulation unit modulates the surface emitting semiconductor element. The Examiner asserts that the OPS-structure 32 corresponds to the surface emitting semiconductor element. As noted above, the controller adjust the driver 76, not the OPS-structure 32. Thus, Caprara et al. do not teach or suggest the modulation unit of claim 1 of the present invention. Therefore, claim 1 and its dependent claims 4-8 and 11 are allowable over Caprara et al.

With further regard to claims 4 and 5, Caprara et al. fail to teach or suggest the structure for controlling the spatial mode of the second laser light, as recited in claim 4. In this regard, the Examiner refers to the birefringent filter 52. However, as shown in figure 5, for example, the filter 52 is a separate element from the OPS-structure 32. By contrast, the structure for controlling the spatial mode of the second laser light recited in claim 4 is comprised by the surface emitting semiconductor element. Thus, the filter 52 does not correspond to the claimed structure for controlling spatial mode of claim 4 of the present invention. Therefore, claim 4 and its dependent claim 5 are not anticipated by Caprara for this additional reason.

Claims 1, 4-8 and 11 are rejected as allegedly being anticipated by Raymond et al. Applicant submits that this reference fails to teach or suggest all of the limitations of the claims. In particular, Raymond et al. do not teach or suggest the modulation unit recited in claim 1. Here, the Examiner refers to column 7, lines 29-48. However, the cited excerpt of the reference describes temperature control for the non-linear crystal 18 and the heat sink 30. In the cited excerpt, heat sink 30 is described as being used for temperature control and cooling of the

substrate 12. Thus, the cited excerpt simply refers to temperature control of elements of the apparatus. By contrast, claim 1 of the present invention recites a modulation unit which modulates the surface emitting semiconductor element. Therefore, Raymond et al. do not teach or suggest the modulation unit of claim 1, and therefore claims 1, 4-8 and 11 are not anticipated by Raymond et al.

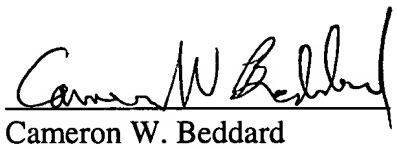
With further regard to claims 4 and 5, Applicant submits that Raymond et al. fails to teach or suggest the structure for controlling a spatial mode of the second laser light, as recited in claim 4. Here, the Examiner refers to beam 52 and column 7, lines 29-48. However, beam 52 is not a structure for controlling a spatial mode. Rather beam 52 is a light beam. Furthermore, column 7, lines 29-48 refer to temperature control for the substrate and the non-linear crystal 18. Therefore, claim 4 and its dependent claim 5 are not anticipated by Raymond et al. for this additional reason.

For the rejection of claims 2, 3, 12 and 13, Applicant submits that Kurtz et al. and Jayaraman fail to make up for the deficiencies of Caprara et al. and Raymond et al. Therefore, claims 2, 3, 12 and 13 are allowable over the prior art.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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